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they pass through the narrow meshed regions they assume a corresponding slender form, to expand later in the wider rings in the region of wider meshwork. The chromosomes are collections of chromatic granules which are arranged on the walls of the meshes, hence they outline a figure corresponding to the shape and size of the mesh. All this, the author concedes, would lend itself to the idea that we are dealing with an alveolar or vesicular structure.

The formation of new cell walls by the thickening and fusing of strands of the framework is apparently similar to the mode of making cell walls in the cleavage of echinoderm eggs as described by G. F. Andrews.[1] And the conception of chromatin granules moving along strands of protoplasm, as do granules in the pseudopodia of rhizopods, is also the same as the flowing or filose movements there described for the interalveolar plasma in various animal tissues and eggs. Considerable space is given to the description of remarkable amœboid movements performed by the cells of the blastoderm ; they may send out very long finger-like pseudopodia which are at first chiefly clear Hyaloplasma but may become granular and be withdrawn. These activities, however, are not known in the normal state, but seem to be called forth by the stimuli that come to the blastoderm when removed to a compressorium for observation. Among other interesting observations we will mention only the occurrence of multiple asters in eggs that had not been fertilized, a phenomenon similar to that observed by T. H. Morgan[2] in echinoderm eggs. The unfertilized eggs of the salmon may be kept in running water for weeks without losing life. In the rainbow trout, also, unfertilized eggs were not dead at the end of several weeks.

Sections of such eggs kept seventeen days show numerous asters in which the radiating lines connect with a rather uniform mesh of the morphoplasm or else with the rays of other asters. At the center of each aster is a group of granules, representing the centrosome.

E. A. A.

Embryology of Invertebrates.[3] — The first part of the original German edition of Korschelt and Heider's Embryology of the Invertebrates. appeared in 1890, and the last part in 1893. The translation of this monumental work was undertaken by Mark and Woodworth, and the first part of the English edition was published in 1895. Since then the translation has been continued by Matilda Bernard, under the editorship of Martin F. Woodward; and last year two additional parts were issued. The portion of the work thus far rendered into English represents about two-thirds of the German text, the chapters on the mollusks, tunicates, and amphioxus having not yet appeared in translation. From these facts it might be inferred that translation was a more time-consuming process than original composition, but the true explanation is doubtless found in the liberal opportunities given to German teachers for work of this kind as compared with that afforded to Englishmen and to Americans.

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[1] The Living Substance. *Journ. of Morphol.*, Supplement 1897.

[2] The Action of Salt Solutions, etc. *Roux's Archiv*, Bd. viii, 1897.

[3] Korschelt, Dr E., and Heider, Dr. K. Text-book of the Embryology of Invertebrates. Vol. i translated by E. L. Mark and W. M. Woodworth ; vols. ii and iii translated by M. Bernard and revised and edited by M. F. Woodward. The Macmillan Company.

The body of the work is well translated, and although considerable freedom is sometimes taken in the adjustment of the substance of a paragraph to its new dress, we have found no place in which this change can be said to have seriously altered the sense. In comparing the several parts, we are inclined to believe that the first is more closely translated than the remaining two.

The arrangement of materials is a model of exactitude. The coarse print, fine print, and notes of the original are rendered as such, and the editor's additions are always clearly indicated by brackets. The more recent literature is usually given in an appendix.

The incorporation of new material was evidently one of the most difficult problems confronting the translators. This naturally has been greatly increased in the last two parts, for the assimilation of almost a decade of embryological work is no small task. As a rule, this has been met by the insertion of the more important new titles in the Literature Appendices, and occasionally by the addition of footnotes. Unsatisfactory as this method often is, it is difficult to see how it could have been improved upon except by a rewriting of the original text.

The way in which Anlage shall be rendered into English is a question that confronts every English translator of German embryological work, and, as the solutions of this question seem to be as numerous as those who attempt it, one is not surprised that the translators of the last two parts should substitute for the word "fundament," used in the first part, their own choice, "rudiment." This calls for some defense, which is given in the preface to the second part, where Darwin's unfortunate use of "rudimentary" for "vestigial" is pointed out as a root of much evil. While this whole matter is one rather of convenience than of importance to the zoölogist, its influence on future lexicographers must be at least confusing, and should even a small proportion of the terms proposed be adopted, the uninitiated might be led to believe that with a command of Anlage and Zug almost any idea could be expressed in German.

In one respect the English edition is a noteworthy advance over the German original. The latter is paged continuously and is concluded with a subject and an author's index. The English parts have each their own paging, a table of contents, and double indices, thus rendering them much more readily usable as reference books. It is to be regretted that this general improvement has not extended to the presswork. Unfortunately in this respect the English edition is decidedly behind the German. In the first and second parts the illustrations, particularly, lack the clearness of the German cuts, and in the third the muddiness of the figures is often a really serious defect. Notwithstanding these shortcomings, the unabridged translation of such a masterly work is a boon to the English-reading zoölogical student, and one can do no less than wish that good fortune may aid in the completion of so worthy a task.

P.

A Recent Book on Insects. — In *Our Insect Friends and Foes, How to Collect, Preserve, and Study Them* (G. P. Putnam's Sons, New York and London, 1899. xix, 377 pp., 225 illustrations), Miss Belle S. Cragin gives directions for collecting, raising, and preserving insects, brief notes on their structure, habits, and habitats, with more detailed notices of some of the commoner forms of hexapods and shorter accounts of related arthropods.

Miss Cragin's book shows a purpose so sincere, and her project is so praiseworthy, that it is especially unfortunate not to be able to commend her effort. The directions for the collection and preservation of insects, though not better than others equally available, do not seriously offend by what they contain or omit. The more detailed accounts, however, show so slight a personal knowledge with the subject that very little can be said in favor of the book as a guide to instruct young students or to quicken their interest in the study of insects.

The essential characteristics for a book on insects, written for young people, are an attractive literary style, clear, concise, and accurate statements arranged in logical, scientific sequence. Judged from this standpoint, Miss Cragin's book cannot be regarded as even moderately successful. It would be hard to find a book dealing with insects in which the orders and families are arranged in so confusing and unscientific a manner. Misleading and inaccurate statements